



Cedars-Sinai Medicine
Physician Guideline for Brain Imaging in the evaluation of Patients with
Atraumatic Headache

BACKGROUND:

Patients commonly present to acute settings through self or physician referral for evaluation of acute or chronic headaches without trauma. Although a small percentage of patients are diagnosed with intracranial mass lesions or hemorrhagic syndromes, most who receive imaging studies do not have radiographic abnormalities and suffer from benign headache syndromes. Recent literature on the radiation hazards associated with CT and healthcare costs associated with advanced imaging argue for a standardized approach to outpatient and inpatient imaging that is patient-centered, yet resource and cost effective.

PURPOSE:

To standardize the decision for and ideal type of acute neuroimaging of patients presenting with acute or chronic headaches without trauma.

GOALS:

- (1) Rapid identification of patients with intracranial hemorrhagic syndromes, intracranial edema/hypertension, or new mass occupying lesions.
- (2) Appropriate utilization of CT, CT Angiography, and MRI based on current evidence-based best practice.
- (3) Use of the best imaging modality deemed clinically necessary to avoid duplicate testing when possible
- (4) Improve ED and hospital throughput of patients requiring non-emergent further evaluation through use of case management to obtain early outpatient follow up of patients deemed stable for deferred imaging.



Indications for neuroimaging

Indication	Preferred test	Notes
New abnormal, otherwise unexplained neurologic findings	MRI	
Altered mental status	CT	
New onset and unexplained in age > 60 years	MRI	
New, with coagulopathy	CT ^b	^b CT better for visualizing blood.
New, with AIDS/immunocompromised	MRI	
Sudden onset, r/o SAH in anticipation of LP	CT ^l	^l In pregnancy, MRI preferred
r/o meningitis/encephalitis In anticipation of LP	CT ^l	^D UTD and ACEP (level C) - LP alone safe for most patients without signs of increased intracranial pressure. ^l In pregnancy, MRI preferred
Unilateral, with neck pain (r/o dissection)	MRI/MRA or CTA ^e	^e CTA if no neurological deficit.
r/o complicated sinusitis/mastoiditis	MRI ^f	^f CT preferred in children to avoid need for sedation, and in adults when evaluating for orbital extension
New, complicated, with known brain mass or metastatic primary.	MRI	Met CA (lung, breast, melanoma, osteosarcoma, GU, head and neck)
r/o VPS obstruction	CT	



Proposed indications for neuroimaging

Indication	Evans	ACR	UTD	ACEP	L of E	CT/MRI	Notes
New abnormal, otherwise unexplained neurologic findings	X		X	X	B	MRI	
Altered mental status	X		X	X	B	CT	
New onset and unexplained in age > 60 years	>50	X*	>50	>50 ^a	B/C	MRI	*ACR - for suspected temporal arteritis, ESR>55 ^a ACEP -outpatient imaging should be scheduled from ED.
New, with coagulopathy			X		C	CT ^b	^b CT better for visualizing blood.
New, with AIDS/ immunocompromised	HIV	HIV	X	HIV	B	MRI	
Sudden onset, r/o SAH in anticipation of LP	X	X	X	X	B	CT ^l	^l In pregnancy, MRI preferred
r/o meningitis/encephalitis In anticipation of LP	X	X	X ^D	X ^D	C	CT ^l	^D UTD and ACEP (level C) - LP alone safe for most patients without signs of increased intracranial pressure. ^l In pregnancy, MRI preferred
Unilateral, with neck pain (r/o dissection)		X	X		C	MRI/MRA or CTA ^e	^e CTA if no neuro deficit.
r/o complicated sinusitis/mastoiditis		X				MRI ^f	^f CT preferred in children to avoid need for sedation, and in adults when evaluating for orbital extension
New, complicated, with known brain mass or metastatic primary.	X		X		C	MRI	Met CA (lung, breast, melanoma, osteosarcoma, GU, head and neck)
r/o VPS obstruction						CT	

Evans = Randolph W Evans, Chief of Neurology, Baylor. ACR= American College of Radiology. UTD= UptoDate. ACEP=American College of Emergency Physicians. L of E=Level of evidence:

Level A recommendations. Generally accepted principles reflecting a high degree of clinical certainty (ie, based on strength of evidence Class I or overwhelming evidence from strength of evidence Class II).

Level B recommendations. Reflect moderate clinical certainty (ie, based on strength of evidence Class II studies that directly address the issue, decision analysis that directly addresses the issue, or strong consensus of strength of evidence Class III studies).

Level C recommendations. Other strategies for patient management that are based on preliminary, inconclusive, or conflicting evidence, or in the absence of any published literature, based on panel consensus.